<table>
<thead>
<tr>
<th><strong>Unit study package code:</strong></th>
<th>WSEN3000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mode of study:</strong></td>
<td>Internal</td>
</tr>
<tr>
<td><strong>Tuition pattern summary:</strong></td>
<td>Note: For any specific variations to this tuition pattern and for precise information refer to the Learning Activities section. Lecture: 1 x 2 Hours Weekly Science Laboratory: 3 x 2 Hours Weekly Seminar: 1 x 2.5 Hours Weekly This unit does not have a fieldwork component.</td>
</tr>
<tr>
<td><strong>Credit Value:</strong></td>
<td>25.0</td>
</tr>
<tr>
<td><strong>Pre-requisite units:</strong></td>
<td>308807 (v.0) Fluid Mechanics 230 or any previous version OR ENGR2000 (v.0) Fluid Mechanics or any previous version</td>
</tr>
<tr>
<td><strong>Co-requisite units:</strong></td>
<td>Nil</td>
</tr>
<tr>
<td><strong>Anti-requisite units:</strong></td>
<td>Nil</td>
</tr>
<tr>
<td><strong>Result type:</strong></td>
<td>Grade/Mark</td>
</tr>
<tr>
<td><strong>Approved incidental fees:</strong></td>
<td>Information about approved incidental fees can be obtained from our website. Visit fees.curtin.edu.au/incidental_fees.cfm for details.</td>
</tr>
<tr>
<td><strong>Unit coordinator:</strong></td>
<td>Title: Dr Name: Ranjan Sarukkalige Phone: 08 9266 3530 Email: <a href="mailto:P.Sarukkalige@curtin.edu.au">P.Sarukkalige@curtin.edu.au</a> Location: Building: 204 - Room: 514</td>
</tr>
<tr>
<td><strong>Teaching Staff:</strong></td>
<td>Name: Faisal Anwar Phone: +61 8 9266 9053 Email: <a href="mailto:F.Anwar@curtin.edu.au">F.Anwar@curtin.edu.au</a> Location: Building: 204 - Room: 509A</td>
</tr>
<tr>
<td></td>
<td>Name: Anna Heitz Phone: +61 8 9266 7267 Email: <a href="mailto:A.Heitz@curtin.edu.au">A.Heitz@curtin.edu.au</a> Location: Building: 216 - Room: 303</td>
</tr>
<tr>
<td></td>
<td>Name: Johan Vandamme Phone: 08 9266 4359 Email: <a href="mailto:Johan.Vandamme@curtin.edu.au">Johan.Vandamme@curtin.edu.au</a> Location: Building: 216 - Room: 308</td>
</tr>
<tr>
<td><strong>Administrative contact:</strong></td>
<td>Name: Cheryl Ip Phone: 08 9266 7524 Email: <a href="mailto:C.Ip@curtin.edu.au">C.Ip@curtin.edu.au</a> Location: Building: 204 - Room: 401</td>
</tr>
</tbody>
</table>
Acknowledgement of Country

We respectfully acknowledge the Indigenous Elders, custodians, their descendants and kin of this land past and present.

Syllabus


Introduction

Welcome to Hydrology and Environmental Engineering. This unit has two parts
1. Hydrology
2. Environmental Engineering

Unit Learning Outcomes

All graduates of Curtin University achieve a set of nine graduate attributes during their course of study. These tell an employer that, through your studies, you have acquired discipline knowledge and a range of other skills and attributes which employers say would be useful in a professional setting. Each unit in your course addresses the graduate attributes through a clearly identified set of learning outcomes. They form a vital part in the process referred to as assurance of learning. The learning outcomes tell you what you are expected to know, understand or be able to do in order to be successful in this unit. Each assessment for this unit is carefully designed to test your achievement of one or more of the unit learning outcomes. On successfully completing all of the assessments you will have achieved all of these learning outcomes.

Your course has been designed so that on graduating we can say you will have achieved all of Curtin’s Graduate Attributes through the assurance of learning process in each unit.

<table>
<thead>
<tr>
<th>On successful completion of this unit students can:</th>
<th>Graduate Attributes addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Apply the principles of hydrology to Water and Environmental Engineering</td>
<td>📚</td>
</tr>
<tr>
<td>2 Analyse, plan, and design the components of hydrologic systems</td>
<td>📚</td>
</tr>
<tr>
<td>3 Apply the principle of Public works engineering to Water and Environmental Engineering</td>
<td>📚</td>
</tr>
<tr>
<td>4 Analyse water and wastewater treatment processes, solid waste management, and air pollution aspects</td>
<td>📚</td>
</tr>
</tbody>
</table>
Curtin’s Graduate Attributes

- Apply discipline knowledge
- Thinking skills (use analytical skills to solve problems)
- Information skills (confidence to investigate new ideas)
- Communication skills
- Technology skills
- Learning how to learn (apply principles learnt to new situations) (confidence to tackle unfamiliar problems)
- International perspective (value the perspectives of others)
- Cultural understanding (value the perspectives of others)
- Professional Skills (work independently and as a team) (plan own work)

Find out more about Curtin’s Graduate attributes at the Office of Teaching & Learning website: ctl.curtin.edu.au

Learning Activities

Learning Activities

- Part 1 (Hydrology) - Lecture: 2 hrs per week
- Part 2 (Env Eng) - Lecture/seminar: 2.5 hrs per week
- Part 2 (Env Eng) - Laboratory: Two lab sessions (lab #1 and lab #2) - Please refer the lab registry to find out your lab session. Laboratory venue is B601-104 (Technology Park)

Assessment

Assessment schedule

<table>
<thead>
<tr>
<th>Task</th>
<th>Value %</th>
<th>Date Due</th>
<th>Unit Learning Outcome(s) Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid Semester exam</td>
<td>40 percent</td>
<td>TBA</td>
<td>1,2,3,4</td>
</tr>
<tr>
<td>Lab report</td>
<td>10 percent</td>
<td>Week: two weeks after the lab session Day: two weeks after the lab session Time: 4.00pm</td>
<td>3,4</td>
</tr>
<tr>
<td>Final Exam</td>
<td>50 percent</td>
<td>Week: Exam period Day: TBA Time: TBA</td>
<td>1,2,3,4</td>
</tr>
</tbody>
</table>

Detailed information on assessment tasks

1. Mid Semester Exam
2. Laboratory report (two reports)
3. Final exam

Pass requirements

To pass this unit you must:

- Achieve an overall grade/mark greater than or equal to 5/50.
- Obtain more than 50% for the exam component (the summed marks for the midterm and final exams)
- Attend both lab sessions and submit the lab reports.
Fair assessment through moderation

Moderation describes a quality assurance process to ensure that assessments are appropriate to the learning outcomes, and that student work is evaluated consistently by assessors. Minimum standards for the moderation of assessment are described in the Assessment and Student Progression Manual, available from policies.curtin.edu.au/policies/teachingandlearning.cfm

Late assessment policy

This ensures that the requirements for submission of assignments and other work to be assessed are fair, transparent, equitable, and that penalties are consistently applied.

1. All assessments students are required to submit will have a due date and time specified on this Unit Outline.
2. Students will be penalised by a deduction of ten percent per calendar day for a late assessment submission (eg a mark equivalent to 10% of the total allocated for the assessment will be deducted from the marked value for every day that the assessment is late). This means that an assessment worth 20 marks will have two marks deducted per calendar day late. Hence if it was handed in three calendar days late and given a mark of 16/20, the student would receive 10/20. An assessment more than seven calendar days overdue will not be marked and will receive a mark of 0.

Assessment extension

A student unable to complete an assessment task by/on the original published date/time (eg examinations, tests) or due date/time (eg assignments) must apply for an assessment extension using the Assessment Extension form (available from the Forms page at students.curtin.edu.au/administration/) as prescribed by the Academic Registrar. It is the responsibility of the student to demonstrate and provide evidence for exceptional circumstances beyond the student’s control that prevent them from completing/submitting the assessment task.

The student will be expected to lodge the form and supporting documentation with the unit coordinator before the assessment date/time or due date/time. An application may be accepted up to five working days after the date or due date of the assessment task where the student is able to provide an acceptable explanation as to why he or she was not able to submit the application prior to the assessment date. An application for an assessment extension will not be accepted after the date of the Board of Examiners’ meeting.

Deferred assessments

If your results show that you have been granted a deferred assessment you should immediately check OASIS for details.

Deferred examinations/tests will be held from 14/02/2017 to 17/02/2017. Notification to students will be made after the Board of Examiners’ meeting via the Official Communications Channel (OCC) in OASIS.

Supplementary assessments

Supplementary assessments, if granted by the Board of Examiners, will have a due date or be held between 14/02/2017 and 17/02/2017. Notification to students will be made after the Board of Examiners’ meeting via the Official Communications Channel (OCC) in OASIS.

It is the responsibility of students to be available to complete the requirements of a supplementary assessment. If your results show that you have been granted a supplementary assessment you should immediately check OASIS for details.

Reasonable adjustments for students with disabilities/health circumstances likely to impact on studies

A Curtin Access Plan (CAP) is a document that outlines the type and level of support required by a student with a disability or health condition to have equitable access to their studies at Curtin. This support can include alternative exam or test arrangements, study materials in accessible formats, access to Curtin’s facilities and services or other support as discussed with an advisor from Disability Services (disability.curtin.edu.au). Documentation is required.

The only authoritative version of this Unit Outline is to be found online in OASIS
from your treating Health Professional to confirm your health circumstances.
If you think you may be eligible for a CAP, please contact Disability Services. If you already have a CAP please provide
it to the Unit Coordinator at the beginning of each semester.

Referencing style
The referencing style for this unit is Chicago.
More information can be found on this style from the Library web site:

Copyright
© Curtin University. The course material for this unit is provided to you for your own research and study only. It is
subject to copyright. It is a copyright infringement to make this material available on third party websites.

Academic Integrity (including plagiarism and cheating)
Any conduct by a student that is dishonest or unfair in connection with any academic work is considered to be
academic misconduct. Plagiarism and cheating are serious offences that will be investigated and may result in
penalties such as reduced or zero grades, annulled units or even termination from the course.
Plagiarism occurs when work or property of another person is presented as one's own, without appropriate
acknowledgement or referencing. Submitting work which has been produced by someone else (e.g. allowing or
contracting another person to do the work for which you claim authorship) is also plagiarism. Submitted work is
subjected to a plagiarism detection process, which may include the use of text matching systems or interviews with
students to determine authorship.
Cheating includes (but is not limited to) asking or paying someone to complete an assessment task for you or any
use of unauthorised materials or assistance during an examination or test.
From Semester 1, 2016, all incoming coursework students are required to complete Curtin’s Academic Integrity
Program (AIP). If a student does not pass the program by the end of their first study period of enrolment at Curtin,
their marks will be withheld until they pass. More information about the AIP can be found at:
https://academicintegrity.curtin.edu.au/students/AIP.cfm
Refer to the Academic Integrity tab in Blackboard or academicintegrity.curtin.edu.au for more information, including
student guidelines for avoiding plagiarism.

Information and Communications Technology (ICT) Expectations
Curtin students are expected to have reliable internet access in order to connect to OASIS email and learning systems
such as Blackboard and Library Services.
You may also require a computer or mobile device for preparing and submitting your work.
For general ICT assistance, in the first instance please contact OASIS Student Support:
oasisapps.curtin.edu.au/help/general/support.cfm
For specific assistance with any of the items listed below, please contact The Learning Centre:
life.curtin.edu.au/learning-support/learning_centre.htm
• Using Blackboard, the I Drive and Back-Up files
• Introduction to PowerPoint, Word and Excel
EA competencies assessed and level of thinking

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>EA Professional competencies assessed ¹</th>
<th>Level of thinking ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid semester test</td>
<td>1.3. Specialist knowledge</td>
<td>Comprehension and Application Analysis and Synthesis</td>
</tr>
<tr>
<td>Laboratory</td>
<td>1.1. Science/Engineering fundamentals</td>
<td>Application and Analysis</td>
</tr>
<tr>
<td></td>
<td>1.2. Conceptual understanding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.2. Use of techniques</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.2. Communication</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.6. Team work</td>
<td></td>
</tr>
<tr>
<td>Final exam</td>
<td>1.3. Specialist knowledge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.5. Context</td>
<td></td>
</tr>
</tbody>
</table>

ENGINEERS AUSTRALIA  Stage 1 competencies and elements of competency assessed in this unit ¹

1. KNOWLEDGE AND SKILL BASE

1.1. Science/Engineering fundamentals: Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.

1.2. Conceptual understanding: Conceptual understanding of the, mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.

1.3. Specialist knowledge: In-depth understanding of specialist bodies of knowledge within the engineering discipline.

1.4. Development & Research: Discernment of knowledge development and research directions within the engineering discipline.

1.5. Context: Knowledge of contextual factors impacting the engineering discipline.

1.6. Engineering Practice: Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline.

2. ENGINEERING APPLICATION ABILITY

2.1. Problem solving: Application of established engineering methods to complex engineering problem solving.

2.2. Use of techniques: Fluent application of engineering techniques, tools and resources.

2.3. Systematic use: Application of systematic engineering synthesis and design processes.

2.4. Project management: Application of systematic approaches to the conduct and management of engineering projects.

3. PROFESSIONAL AND PERSONAL ATTRIBUTES

3.1. Professionalism: Ethical conduct and professional accountability

3.2. Communication: Effective oral and written communication in professional and lay domains.

3.3. Creativity: Creative, innovative and pro-active demeanour.

3.4. Information use: Professional use and management of information.

3.5. Self Conduct: Orderly management of self, and professional conduct.
3.6. Team work: Effective team membership and team leadership.

Levels of thinking

Knowledge
Recall of something encountered before but without having to change it, use it or understand it; facts.

Comprehension
Understanding the knowledge that has been acquired without needing to relate it to other information.

Application
Use of a learned concept to resolve some situation or solve a new problem in an appropriate way.

Analysis
Taking something learned apart into separate components for purposes of thinking about the parts and how they fit together.

Synthesis
Generating or creating something different by assembling or connecting ideas in a way that makes a whole.

Evaluation
Looking at the particular value of materials, information or methods in characterizing the whole.

Enrolment
It is your responsibility to ensure that your enrolment is correct - you can check your enrolment through the eStudent option on OASIS, where you can also print an Enrolment Advice.

Student Rights and Responsibilities
It is the responsibility of every student to be aware of all relevant legislation, policies and procedures relating to their rights and responsibilities as a student. These include:

- the Student Charter
- the University’s Guiding Ethical Principles
- the University’s policy and statements on plagiarism and academic integrity
- copyright principles and responsibilities
- the University’s policies on appropriate use of software and computer facilities

Information on all these things is available through the University’s “Student Rights and Responsibilities” website at: students.curtin.edu.au/rights.

Student Equity
There are a number of factors that might disadvantage some students from participating in their studies or assessments to the best of their ability, under standard conditions. These factors may include a disability or medical condition (e.g. mental illness, chronic illness, physical or sensory disability, learning disability), significant family responsibilities, pregnancy, religious practices, living in a remote location or another reason. If you believe you may be unfairly disadvantaged on these or other grounds please contact Student Equity at eesj@curtin.edu.au or go to http://eesj.curtin.edu.au/student_equity/index.cfm for more information.

You can also contact Counselling and Disability services: http://www.disability.curtin.edu.au or the Multi-faith services: http://life.curtin.edu.au/health-and-wellbeing/about_multifaith_services.htm for further information.

It is important to note that the staff of the university may not be able to meet your needs if they are not informed of your individual circumstances so please get in touch with the appropriate service if you require assistance. For general wellbeing concerns or advice please contact Curtin’s Student Wellbeing Advisory Service at: http://life.curtin.edu.au/health-and-wellbeing/student_wellbeing_service.htm
Recent unit changes

Students are encouraged to provide unit feedback through eVALUate, Curtin’s online student feedback system. For more information about eVALUate, please refer to evaluate.curtin.edu.au/info/.

Recent changes to this unit include:

This unit replaces the former unit, Water and Environmental Engineering 362.

To view previous student feedback about this unit, search for the Unit Summary Report at https://evaluate.curtin.edu.au/student/unit_search.cfm. See https://evaluate.curtin.edu.au/info/dates.cfm to find out when you can eVALUate this unit.
### Program Calendar

#### Program Calendar – Semester 2 2016

<table>
<thead>
<tr>
<th>Week</th>
<th>Begin Date</th>
<th>TUESDAY (2.00-4.00pm)</th>
<th>FRIDAY (3.00-5.30pm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td>25 July</td>
<td></td>
<td>Orientation Week</td>
</tr>
<tr>
<td>1.</td>
<td>1 August</td>
<td>Hydrology</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>2.</td>
<td>8 August</td>
<td>Hydrology</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>3.</td>
<td>15 August</td>
<td>Hydrology</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>4.</td>
<td>22 August</td>
<td>Hydrology</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>5.</td>
<td>29 August</td>
<td></td>
<td>Tuition Free Week</td>
</tr>
<tr>
<td>6.</td>
<td>5 September</td>
<td>Hydrology</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>7.</td>
<td>12 September</td>
<td>Hydrology</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>8.</td>
<td>19 September</td>
<td>Hydrology</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>9.</td>
<td>26 September</td>
<td></td>
<td>Tuition Free Week</td>
</tr>
<tr>
<td>10.</td>
<td>3 October</td>
<td>Hydrology</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>11.</td>
<td>10 October</td>
<td>Hydrology</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>12.</td>
<td>17 October</td>
<td>Hydrology</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>13.</td>
<td>24 October</td>
<td>Hydrology</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>14.</td>
<td>31 October</td>
<td>Hydrology</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>15.</td>
<td>7 November</td>
<td></td>
<td>Study Week</td>
</tr>
<tr>
<td>16.</td>
<td>14 November</td>
<td></td>
<td>Examinations</td>
</tr>
<tr>
<td>17.</td>
<td>21 November</td>
<td></td>
<td>Examinations</td>
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</tbody>
</table>